Grid Codes Comparison

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1 Voltage Support

Positive sequence voltage support:

$$\begin{cases} i_+ = 0 & \text{if } u_+ \geq 0.9 \\ i_+ = k_{sp}(0.9 - u_+) & \text{if } 0.5 < u_+ < 0.9 \\ i_+ = i_{\max} & \text{if } u_+ \leq 0.9 \end{cases} \tag{1}$$

Negative sequence voltage support:

$$\begin{cases} i_- = 0 & \text{if } |u_-| \leq 0.1 \\ i_- = \mp k_{sp}(|u_-| - 0.1) & \text{if } 0.1 < |u_-| < 0.5 \\ i_- = i_{\max} & \text{if } |u_-| \geq 0.5 \end{cases} \tag{2}$$

Implement the current saturation in abc frame:

$$i_{abc} \leq i_{abc}^{\max} \tag{3}$$

2 Task

Sweep different short-circuit impedance:

$$\underline{z}_{sc} = z_{sc} \angle \theta \tag{4}$$

sweep different combinations of z_{sc} and θ: $z_{sc} \in [0.001, 1]$, $\theta \in [0, 90^o]$. Compared the results from 4 options: only positive support; both positive and negative support; OPT; ROPT.

Be careful of the multiple solutions problem (non-smooth solution curves).